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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KOLLIAS, ALEXANDER C

ART UNIT

PAPER NUMBER

1796

NOTIFICATION DATE

DELIVERY MODE

08/10/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/596,722	<b>Applicant(s)</b> HOESCHELER ET AL.	
	<b>Examiner</b> ALEXANDER C. KOLLIAS	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 19-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20090406</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. All outstanding claims objections and 35 USC 112, 2nd paragraph rejections are withdrawn in light of applicant's amendment filed on 4/6/2009.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.
3. The molar amounts of the glass filler material disclosed by Hoescheler were inadvertently incorrectly stated. Therefore, the previously set forth rejection of the claims over Hoescheler has been withdrawn and this Office Action is therefore non-final..

### ***Claim Rejections - 35 USC § 112***

- 4.. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 19-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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6. Claim 19 recites a method wherein "glass filler particles have an inner zone and an outer zone up to 1.5 microns and wherein the mean concentration of alkali ions of the outer zone relative to the mean concentration of alkali ions of the inner zone is 10 % or less and the alkali ions of the inner zone do not significantly migrate to the outer zone". However, it is noted that while Page 2, Lines 1-5 of the Specification discloses filler particles of the glass material haven an inner zone and an outer zone up to 1.5 microns and the mean concentration of alkali ions of the outer zone relative to the mean concentration of alkali ions of the outer zone is 10 % of less and the alkali ions of the inner zone do not significantly migrate to the outer zone" and Page 13, Liens 24-29 discloses that in the method of making the filler material that "the alkali of the inner zone do not significantly migrate to the outer zone", there is no support in the Specification for a method of forming glass particles wherein the glass particles have the properties presently recite in claim 19, i.e., an inner and an outer zone up to 1.5 microns and the mean concentration of alkali ions of the outer zone relative to the mean concentration of alkali ions of the inner zone is 10 % or less. That is to say, there is no clear nexus in the present Specification that the method of claim 30 does in fact produce the filler material recite in claim 19.

7. Claim 20 recites a method wherein glass filler particles have an inner zone and an outer zone up to 1.5 microns an wherein the mean concentration of alkali ions of the outer zone relative to the mean concentration of alkali ions of the inner zone is 10 % or less and the alkali ions of the inner one are fixed in the particles by a drying process". However, it is noted that while Page 2, Lines 1-5 of the Specification discloses filler particles of the glass material haven an inner zone and an outer zone up to 1.5 microns and the mean concentration of alkali ions of

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the outer zone relative to the mean concentration of alkali ions of the outer zone is 10 % or less and the alkali ions of the inner zone do not significantly migrate to the outer zone" and Page 13, Lines 24-29 discloses that in the method of making the filler material that "the alkali of the inner zone do not significantly migrate to the outer zone", there is no support in the Specification for a method of forming glass particles wherein the glass particles have the properties presently recited in claim 20, i.e., an inner and an outer zone up to 1.5 microns and the mean concentration of alkali ions of the outer zone relative to the mean concentration of alkali ions of the inner zone is 10 % or less and the alkali ions of the inner zone are fixed in the particles by a drying process. That is to say, there is no clear nexus in the present Specification that the method of claim 30 does in fact produce the filler material recited in claim 20.

8. Claims 22 and 26 recite a method wherein the concentration of earth alkali metal oxides is not over 2 mol %. However, it is noted that while the Specification discloses embodiments on Pages 7 and 8 wherein the earth metal oxides comprise 0 to 25 mol % (Page 7, Line 12), 0 to 15 mol % (Page 7 Lines 21), 0 to 5 mol % alkali earth metal oxides (Page 7, Line 30), there is no explicit disclosure in the Specification as originally filed of a method of forming glass material where the glass particles comprise alkali earth metal oxides in an amount not more than 2 mol % as presently recited in claims 22 and 26.

9. Claims 24 and 28 recite a method wherein the maximal particle size is up to 100 microns. However it is noted that while Page 11, Lines 6-8 of the Specification disclose that the maximal particle size of the glass filler is 100 microns and Page 12, Lines 25-30 of the Specification

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disclose that the glass granulate is mean to mean particles size from 0.1 to 20 microns, there is no explicit disclosure in the Specification as originally filed of a method of forming glass material wherein the particles have a maximal size of 100 microns as presently recited in claims 24 and 28.

10. Claims 25 and 29 recite that “the refractive index of the glass filler material is in the range of about 1.49 to 1.55”. However, it is noted that while the Specification discloses on Page 11, Lines 14-16 that the filler material has a refractive index of 1.49 to 1.55, there is no explicit disclosure in the Specification as originally filed of a method wherein the glass particles have the refractive index as presently recited in claims 25 and 29.

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claim 19-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. Claim 19 recites that the “alkali ions of the inner zone do not significantly migrate to the outer zone, which renders the scope of the claim indefinite as it is unclear what applicant considers to be "significant migration" of the alkali ions.

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14. Claim 30 recites the phrase “cold water”, which renders the scope of the claim indefinite, as it is not clear what Applicant's definition of “cold water is. Is it for example 10 degrees C, 5 degrees C, etc?

15. Claim 30 recites dealkalinizing the glass powder in excess with a dealkalinizing agent”. The phrase “in excess” renders the scope of the claim indefinite, as it is unclear what amount of dealkalinization agents is considered by Applicant to be in excess of the glass filler.

### *Claim Objections*

16. Claim 19, 20 and 21 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

17. Claim 30 recites the following concentrations of inorganic oxides:

- a. about 54 to 91 mol % of  $\text{SiO}_2$ ,
- b. 0 to about 13.6 mol %  $\text{Al}_2\text{O}_3$  and/or  $\text{B}_2\text{O}_3$
- c. 0 to about 27.3 mol %  $\text{ZrO}_2$  and/or  $\text{TiO}_2$ , and/or  $\text{HfO}_2$  and/or  $\text{Y}_2\text{O}_3$  and/or  $\text{Sc}_2\text{O}_3$  and/or  $\text{La}_2\text{O}_3$  and/or  $\text{CeO}_2$  and or other lanthanide oxides
- d. about 9 to about 20 mol % alkali metal oxides
- e. 0 to about 22.7 mol % earth alkali oxides

However, claim 19 recites the following concentration of inorganic oxides:

- a. about 65 to 99.95 mol %  $\text{SiO}_2$

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- b. 0 to about 15 mol %  $\text{Al}_2\text{O}_3$ ,  $\text{B}_2\text{O}_3$
- c. 0 to about 30 mol %  $\text{ZrO}_2$ ,  $\text{TiO}_2$ ,  $\text{Hf}_2$ ,  $\text{Y}_2\text{O}_3$  and/or  $\text{Sc}_2\text{O}_3$ , and/or  $\text{La}_2\text{O}_3$  and/or  $\text{CeO}_2$  and/or other lanthanide oxides.
- d. about 0.05 to about 4 mol % alkali metal oxides,  $\text{Na}_2\text{O}$ ,  $\text{Li}_2\text{O}$ ,  $\text{K}_2\text{O}$ ,  $\text{Rb}_2\text{O}$ ,  $\text{Cs}_2\text{O}$
- e. 0 to about 25 mol % earth alkali metal oxides,  $\text{MgO}$ ,  $\text{CaO}$ ,  $\text{SrO}$ , and  $\text{BaO}$ .

The amounts of compounds (a), (b), (c), and (e) recited in claim 19 are broader than the amount of (a), (b), (c), and (e) recited in claim 30. Therefore, claim 19 fails to further limit the amounts of  $\text{SiO}_2$ , aluminum oxide and/or boron oxide, zirconium oxide and other lanthanum oxides, and alkali earth metal oxides recited in claim 30.

18. Claim 30 recites the following concentrations of inorganic oxides:

- a. about 54 to 91 mol % of  $\text{SiO}_2$ ,
- b. 0 to about 13.6 mol %  $\text{Al}_2\text{O}_3$  and/or  $\text{B}_2\text{O}_3$
- c. 0 to about 27.3 mol %  $\text{ZrO}_2$  and/or  $\text{TiO}_2$ , and/or  $\text{HfO}_2$  and/or  $\text{Y}_2\text{O}_3$  and/or  $\text{Sc}_2\text{O}_3$  and/or  $\text{La}_2\text{O}_3$  and/or  $\text{CeO}_2$  and or other lanthanide oxides
- d. about 9 to about 20 mol % alkali metal oxides
- e. 0 to about 22.7 mol % earth alkali oxides

However, claim 20 recites the following concentration of inorganic oxides:

- a. about 75 to 96.95 mol %  $\text{SiO}_2$
- b. 0 to about 10 mol %  $\text{Al}_2\text{O}_3$ ,  $\text{B}_2\text{O}_3$
- c. about 3 to about 30 mol %  $\text{ZrO}_2$ ,  $\text{TiO}_2$ ,  $\text{HfO}_2$ ,  $\text{Y}_2\text{O}_3$  and/or  $\text{Sc}_2\text{O}_3$ , and/or  $\text{La}_2\text{O}_3$  and/or  $\text{CeO}_2$  and/or other lanthanide oxides.



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- d. about 0.05 to about 3 mol % alkali metal oxides, Na<sub>2</sub>O, Li<sub>2</sub>O, K<sub>2</sub>O, Rb<sub>2</sub>O, Cs<sub>2</sub>O
- e 0 to about 15 mol % earth alkali metal oxides, MgO, CaO, SrO, and BaO.

The amounts of compounds (a), (c), and (d) recited in claim 20 are broader than the amount of (a), (b), (c), and (e) recited in claim 30. Therefore, claim 20 fails to further limit the amounts of SiO<sub>2</sub>, aluminum oxide and/or boron oxide, zirconium oxide and other lanthanum oxides, and alkali earth metal oxides recited in claim 30.

19. Claim 38 is objected to under 37 CFR 1.75(c) as being in improper form because a claim cannot refer to two set of claims drawn to separate features. See MPEP § 608.01(n).

***Claim Rejections - 35 USC § 103***

20. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

21. Claims 19-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brodtkin et al (US 2002/0157570) in view of Hoescheler et al (WO 2002/055028, see English language equivalent US 2004/0116550), Schmitt et al (US 4,376,835), Siebers (US 5,250,474) and Hecq et al (US 5,093,196).

Regarding claims 30 and 32-34, Brodtkin et al discloses a method of producing ceramic utilized in dental restorations comprising inorganic oxides in the following concentrations (Abstract, Page 1 [0006]-[0007], Page 2 [0009] and Table 1):

- a. 30-65 mol. % SiO<sub>2</sub>,

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- b. 0-10 mol. %  $\text{Al}_2$  and  $\text{B}_2\text{O}_3$ .
- c. 0-4 mol. %  $\text{ZrO}_2$
- d. 0-3 mol. %  $\text{Li}_2\text{O}$ , 0-10 mol. %  $\text{K}_2\text{O}$ , and  $-7$  mol. %  $\text{Na}_2\text{O}$ , for a total of 0 to 20 mol. % alkali metal oxides.
- e. 0-5 mol. %  $\text{CaO}$  and 15-33 mol. %  $\text{MgO}$ , for a total of 15- 35 mol. % alkali earth metal oxides.

The above metal oxides are melted at a temperatures from 1200 to 1650 degrees C for 0.5 to 8 hours (Page 2 [0011]). Furthermore, the reference discloses that the powders is quenches and pulverized into a powder. Although the reference does not disclose that the melted glass is crushed by transferring into cold water, it is the Examiner's position that disclosure by the reference of quenching meets the claimed limitation. Evidence to support this position is found in Siebers which discloses quenching of melted glass by transferring to cold water in order to form a cullet, .i.e., broken glass (Abstract, Column 2, Lines 30-45, Column 2, Lines 67-68, Column 3, Lines 11-22 and Column 4, Lines 45-52).

Additionally, Brodtkin discloses that the quenches glass is pulverized into a powder which is sieved to obtain the required particle size (Page 2, [0011]). However, the reference does not disclose that the granulated glass have an average particle from about 0.1 to 20 microns.

Hoescheler et al discloses a glass compositions comprising inorganic oxides, similar in composition make-up, amount, and produced in a manner similar to that disclosed by Brodtkin (Abstract, Page 3 [0038]-[0040]). The reference discloses that the filler ceramic glass has an average particle size from 0.8 to 1.5 microns (Page 3, 0042)).

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Regarding the particle size disclosed by Hoescheler et al, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

The combined disclosures of Brodtkin and Hoescheler teach all the claim limitations as set forth above. However, they do not disclose dealkalizing the glass powder with a dealkalizing agent.

Hecq et al discloses a process wherein dealkalization of glass containing sodium ions is performed utilizing acids such as hydrochloric acid in order to maintain a sodium ion concentration in a core region while having a glass surface which is dealkalized to depth such that a sodium ion gradient concentration exists (Abstract and Column 7, Lines 5-18 and Lines 23-26). It is clear that the dealkalizing agent disclosed by Hecq is an acidic composition .i.e. HCl, thus meeting the limitations recited in claims 32 and 33.

Given that both Brodtkin and Hecq and Schmidtt are drawn to glass compositions and method of manufacturing such compositions, in light of the particular advantages provided by the use and control of the acid dealkalizing agents disclosed by Hecq, it would therefore have been obvious to one of ordinary skill in the art to include such process steps in method disclosed by Brodtkin in order to obtain glass particles which have a alkali metal concentration gradient.

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The combined disclosures of Brodtkin, Hoescheler, and Hecq teach all the claim limitations as set forth above. However, the Brodtkin does not disclose a process wherein the dealkalizing agent is removed and washing the glass powder with a polar solvent until the filtrate reacts neutral.

Schmidt discloses a process of dealkalizing glass wherein glass powders are separated are thoroughly washed with water to leave the surface of the particles substantially free of alkali (Column 4, Lines 60-65 and Column 6, Lines 33-41). It is the examiner's this meets the claimed limitation that the composition is washed until the filtrate react neutral as well as polar solvent, i.e., water recite in claim 34. The reference discloses that the powder is dried at a temperature above 70 degrees C (Column 4, Lines 60-65). Although the reference does not explicitly disclose a time period, from the examples which disclose a time period of 2 hours, it is clear that the disclosed drying time meets the recited limitation of at least 30 minutes, recited in step (f) of claim 30. Furthermore, although the reference does not explicitly disclose an upper bound, it would have been obvious to one of ordinary skill in art to dry the composition below the melting point of glass composition in order to avoid sintering of the glass powder.

Given that the combined disclosures of Brodtkin, Hoescheler, Hecq are drawn to dealkalizing glass compositions, in light of the particular advantages provided by washing and drying the glass powders as taught by Schmidt, it would therefore have been obvious to one of ordinary skill in the art to include such process steps in the process disclosed by Brodtkin, Hoescheler, and Hecq with a reasonable expectation of success.

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Regarding claim 31, the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidtt teach all the claim limitations as set forth above. As discussed above, Brodtkin discloses melting of the inorganic oxides at a temperature range from 1200 to 1650 degrees C.

Regarding the melting temperature disclosed by the reference, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir. 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claims 35, the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidtt teach all the claim limitations as set forth above. As discussed above, Hecq discloses dealkalization of glass. Furthermore, the reference discloses a process wherein dealkalization is performed at temperatures below 300 degrees C (Column 6, Lines 55-61). The reference disclose that at this temperature as it discourages replenishment of the alkali ion population in the surface layers of the glass as well facilitates subsequent rapid cooling of the glass (Column 6, Lines 55-61).

Given that Brodtkin is drawn to a process of producing glass powder and, in light of the particular advantages provided by the use and control of the temperature in the dealkalization process as taught by Hecq, it would therefore have been obvious to one of ordinary skill in the

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art to include such process steps in dealkalizing the glass material disclosed by Brodtkin with a reasonable expectation of success

Regarding claim 36, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidtt teach all the claim limitations as set forth above. As discussed above dealkalization of glass is taught by Hecq and Schmidtt. Furthermore, although Schmitt does not disclose a specific range regarding the ratio of glass powder to dealkalization agent, attention is drawn to Example 1 of the reference, where 100 grams of powder are slurried with 1000 grams of aqueous HCl it is clear that the amount of dealkalizing agent is used in excess of the amount of powder. The ratio of powder to dealkalizing agent determined from the reference is 1:10, within the claimed range of 1:5 to 1:1000 recited in claim 36.

Regarding the ratio of glass to dealkalizing agent disclosed by Schmidtt, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir. 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claims 38-39 and 40, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidtt teach all the claim limitations as set forth above. However, Brodtkin does not disclose a polymerization dental material containing about 3 to about 80 wt % cationically or

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radically curable monomers, about 3 to 90 wt % of glass filler, 0 to 90 wt % of one or more radio-opaque fillers, about 0.01 to about 25 wt % of initiators, retarders or accelerators and 0 to about 25 wt% of auxiliary agents.

Hoescheler et al, teaches all the claim limitations as set forth above discloses that the glass filler is used in a polymerizable material comprising 3 to 80 wt % of one or more cationically curable monomers, 3 to 90 wt % of the glass filler composition, 3 to 90 wt % of radio-opaque fillers, 0.01 to 25 wt. 5 of initiators, retarders, and/or accelerators and 0 to 25 wt % of auxiliary agents (Column 2, Lines 27-39). It is noted that the amounts of cationic monomer (a) glass filler (b), radio-opaque filler (c) initiators (d), and auxiliary agents (e) disclosed by the reference are within the claimed ranges recited in claim 38. Furthermore, the reference discloses epoxide monomers, such as di(3-epoxycyclohexylethyl)methylphenylsilane (Column 9, Lines 50-67).

Given that both Brodtkin and Hoescheler et al are drawn to glass materials utilized in dental compositions, in light of the particular advantages provided by the use and control of the curable monomers, initiators, auxiliary agents, and radio opaque filler as taught by Hoescheler et al, it would therefore have been obvious to one of ordinary skill in the art to include these additives and amounts thereof in the glass composition disclosed by Brodtkin with a reasonable expectation of success

Regarding claim 37, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidt teach all the claim limitations as set forth above. As discussed above, Brodtkin discloses a glass material which comprises the inorganic oxides and amounts thereof which

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overlap that presently claimed as well as the process steps of melting, quenching and pulverizing identical to that presently claimed, while Hecq and Schmidtt disclose methods of dealkalization of glass utilizing acids which are identical to that presently claimed. Therefore it is the Examiner's position that the process steps disclosed by the combined disclosures of Brodtkin, Schmidt, and Hecq will result in a glass composition with concentrations of inorganic oxides to that presently claimed. Furthermore, it is noted given that Schmidtt and Hecq disclose dealkalization processes which remove alkali and alkali earth metals from glass compositions, the removal of these metals will result in an increase in the concentration of compositional ingredients such as silicon dioxide in the glass compositions disclosed by Brodtkin. Therefore it would have been obvious to one of ordinary skill in the art to control the dealkalization process disclosed by Hecq and Schmidtt in order to adjust the final concentration of the inorganic oxide in the composition disclosed by Brodtkin to values including those presently claimed.

Regarding claim 19, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidtt teach all the claim limitations as set forth above. As discussed above, Brodtkin discloses a glass material which comprises the inorganic oxides and amounts thereof which overlap that presently claimed as well as the process steps of melting, quenching and pulverizing identical to that presently claimed, while Hecq and Schmidtt disclose methods of dealkalization of glass utilizing acids which are identical to that presently claimed. It is noted given that Schmidtt and Hecq disclose dealkalization processes which remove alkali and alkali earth metals from glass compositions, the removal of these metals will result in an increase in the concentration of compositional ingredients such as silicon dioxide in the glass compositions



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disclosed by Brodtkin. Therefore it would have been obvious to one of ordinary skill in the art to control the dealkalization process disclosed by Hecq and Schmitt in order to adjust the final concentration of the inorganic oxide in the composition disclosed by Brodtkin to values including those presently claimed.

Furthermore it is noted that in the prior art Schmitt et al and Hecq disclose compositions comprising silica oxide, alkali and earth alkali oxides in which a depletion zone of alkali metals is obtained such that the concentration of alkali metals are different at the surface than at the core. i.e., the content of the alkali metals increases asymptotically from the surface region to the core region (Column 2, Lines 20-37 and Column 3, Lines 13-19). Therefore, given that Brodtkin discloses a glass compositions comprises inorganic oxides, and Hecq and Schmitt disclose method of dealkalization identical to that presently claimed, it is the Examiner's position that the process disclosed by the combined disclosures of Brodtkin, Hecq and Schmitt will intrinsically result in a glass compositions comprise having an inner zone and an outer zone up to 1.5 microns and wherein the mean concentration of alkali ions of the outer zone relative to the mean concentration of alkali ions of the inner zone is 10 % or less and the alkali ions of the inner zone do not significantly migrate to the outer zone as presently claimed.

Regarding claim 20, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmitt teach all the claim limitations as set forth above. As discussed above, Brodtkin discloses a glass material which comprises the inorganic oxides and amounts thereof which overlap that presently claimed as well as the process steps of melting, quenching and pulverizing identical to that presently claimed, while Hecq and Schmitt disclose methods of dealkalization

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of glass utilizing acids which are identical to that presently claimed. It is noted given that Schmidtt and Hecq disclose dealkalization processes which remove alkali and alkali earth metals from glass compositions, the removal of these metals will result in an increase in the concentration of compositional ingredients such as silicon dioxide in the glass compositions disclosed by Brodtkin. Therefore it would have been obvious to one of ordinary skill in the art to control the dealkalization process disclosed by Hecq and Schmidtt in order to adjust the final concentration of the inorganic oxide in the composition disclosed by Brodtkin to values including those presently claimed.

Furthermore it is noted that in the prior art Schmidtt et al and Hecq disclose compositions comprising silica oxide, alkali and earth alkali oxides in which a depletion zone of alkali metals is obtained such that the concentration of alkali metals are different at the surface than at the core. i.e., the content of the alkali metals increases asymptotically from the surface region to the core region (Column 2, Lines 20-37 and Column 3, Lines 13-19). Therefore, given that Brodtkin discloses a glass compositions comprises inorganic oxides, and Hecq and Schmidtt disclose method of dealkalization identical to that presently claimed, it is the Examiner's position that the process disclosed by the combined disclosures of Brodtkin, Hecq and Schmidtt will intrinsically result in a glass compositions comprise having an inner zone and an outer zone up to 1.5 microns and wherein the mean concentration of alkali ions of the outer zone relative to the mean concentration of alkali ions of the inner zone is 10 % or less and the alkali ions of the inner zone are fixed in the particles by a drying process.

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Regarding claim 21, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidtt teach all the claim limitations as set forth above. As discussed above, Brodtkin discloses a glass material which comprises the inorganic oxides and amounts thereof which overlap that presently claimed as well as the process steps of melting, quenching and pulverizing identical to that presently claimed, while Hecq and Schmidtt disclose methods of dealkalization of glass utilizing acids which are identical to that presently claimed. It is noted given that Schmidtt and Hecq disclose dealkalization processes which remove alkali and alkali earth metals from glass compositions, the removal of these metals will result in an increase in the concentration of compositional ingredients in the glass compositions disclosed by Brodtkin. Therefore it would have been obvious to one of ordinary skill in the art to control the dealkalization process disclosed by Hecq and Schmitt in order to adjust the final concentration of the inorganic oxide in the composition disclosed by Brodtkin to values including those presently claimed.

Regarding claims 22 and 26, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidtt teach all the claim limitations as set forth above. As discussed above, Brodtkin discloses a glass material which comprises the inorganic oxides and amounts thereof which overlap that presently claimed as well as the process steps of melting, quenching and pulverizing identical to that presently claimed, while Hecq and Schmidtt disclose methods of dealkalization of glass utilizing acids which are identical to that presently claimed. It is noted given that Schmidtt and Hecq disclose dealkalization processes which remove alkali and alkali earth metals from glass compositions, the removal of these metals will result in an increase in the

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concentration of compositional ingredients such as silicon dioxide in the glass compositions disclosed by Brodtkin. Therefore it would have been obvious to one of ordinary skill in the art to control the dealkalization process disclosed by Hecq and Schmitt in order to adjust the final concentration of the inorganic oxide in the composition disclosed by Brodtkin to values including those presently claimed.

Regarding claims 23 and 27, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidtt teach all the claim limitations as set forth above. As discussed above Hoescheler et al discloses ceramic filler glass with an average particle size from 0.8 to 1.5 microns (Page 3, 0042]).

Regarding the particle size disclosed by Hoescheler et al, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claims 24 and 28, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidtt teach all the claim limitations as set forth above. However, Brodtkin does not disclose that the glass powder has a maximal size of up to 100 microns.

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Schmitt et al discloses a glass filler composition comprising silicon and alkali oxides (Abstract). Furthermore, the reference discloses that the glass powders have a particle size of at least 0.5 microns and a maximum particle size of 150 microns (Column 4, Lines 16-29). The reference discloses that in order to achieve good mechanical properties a particle size distribution that is not excessively narrow is desired (Column 4, Lines 16-29).

Given that both Brodtkin and Schmidt et al are both drawn to glass particle compositions and method of producing such particles, in light of the particular advantages provided by the use and control of the glass particle size taught by Brodtkin, it would therefore have been obvious to one of ordinary skill in the art to modify the process of pulverization disclosed by Brodtkin to obtain the glass particle size disclosed by Schmidt with a reasonable expectation of success

Regarding claims 25 and 29, , the combined disclosures of Brodtkin, Hoescheler, Hecq, and Schmidt teach all the claim limitations as set forth above. The combined disclosures do not disclose that the ceramic glass filler has an index of refraction from 1.49 to 1.54. However, these limitations are intrinsic in Brodtkin, Hoescheler, Hecq, and Schmidt because the composition and method of forming the glass compositions disclosed in Brodtkin, Hoescheler, Hecq, and Schmidt is identical in composition to glass filler compositions and method of manufacture claimed in the instant application. “Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established.” In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

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***Response to Arguments***

22. Applicant's arguments, see Remarks, filed 4/6/2009, with respect to the rejection(s) of claim(s) 19-39 under 35 U.S.C. 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Brodtkin et al in view of Hoescheler et al, Schmitt et al, Siebers and Hecq et al.

***Conclusion***

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER C. KOLLIAS whose telephone number is (571)-270-3869. The examiner can normally be reached on Monday-Friday, 8:00 AM -5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571)-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/A. C. K./

Examiner, Art Unit 1796

/Vasu Jagannathan/

Supervisory Patent Examiner, Art Unit 1796